

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:  cf. Form PCT/ISA/220		Date of mailing (day/month/year) cf. Form PCT/ISA/210 (Page 2)
Applicant's or agent's file reference cf. Form PCT/ISA/220		<b>FOR FURTHER ACTION</b> See paragraph 2 below
International application No. PCT/DE2004/002604	International filing date (day/month/year) <div style="text-align: center; font-family: cursive;">24/11/2004</div>	Priority date (day/month/year) <div style="text-align: center; font-family: cursive;">05/02/2004</div>
International Patent Classification (IPC) or both national classification and IPC F02M61/14, F02M61/18, F02B23/10		
Applicant ROBERT BOSCH GMBH		

**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

Name and mailing address of the ISA/  Facsimile No.	Authorized officer Nobre, S  Telephone No.
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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2004/002604

Box No. 1 Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing  
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format  
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE  
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International application No.  
PCT/DE2004/002604

Box No. II    Priority

1. ☐ The following document has not yet been furnished:

☐ copy of the earlier application whose priority has been claimed (Rules 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rules 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/DE2004/002604

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	3,5,6,9,11,12	YES
	Claims	1,2,4,7,8,10	NO
Inventive step (IS)	Claims	3	YES
	Claims	1,2,4-12	NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims		NO

2. Citations and explanations:

cf. supplementary page

WRITTEN REPORT OF THE INTERNATIONAL SEARCH OFFICE

(SUPPLEMENTARY PAGE)

Intern. File No. PCT/DE2004/002604

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RE POINT V

Reasoned statement with regard to novelty, inventive step, and industrial applicability; citations and explanations supporting this statement

1.1 Reference is made to the following documents:

- D1: DE 100 26,323 A1 (BOSCH GMBH ROBERT) November 29, 2001 (2001-11-29)
- D2: DE 101 16 466 A1 (BOSCH AUTOMOTIVE SYSTEMS CORP., TOKIO/TOKYO) October 31, 2002 (2002-10-31)
- D3: PATENT ABSTRACTS OF JAPAN Vol. 017, No. 465 (M-1468), August 25, 1993 (1993-08-25) & JP 05 106442 A (YANMAR DIESEL ENGINE CO LTD), April 27, 1993 (1993-04-27)
- D4: DE 100 32 336 A1 (BOSCH GMBH ROBERT) January 17, 2002 (2002-01-17)

The present application does not satisfy the requirements of Article 33(1) PCT, because the subject matter of Claim 1 is not novel within the meaning of Article 33(2) PCT. Document D1 describes (cf. lines [0022-0036], Fig. 1 and 4):

A fuel-injection system (1) for the direct injection of fuel into a combustion chamber (79) through a combustion-chamber top which is disposed across from a piston (6), having a fuel injector (4) which includes a multitude of spray-discharge orifices, a fuel jet (10) being generated by each spray-discharge orifice and a spray cloud being generated in the combustion chamber (79) by the multitude of fuel jets (10), a first opening angle of the fuel envelope (5) being greater in a first plane than a second

opening angle in a second plane that extends perpendicular to the first plane.

- 1.2 The dependent Claims 2, 5, 6, 9, 10, 11 and 12 do not include any features which satisfy the PCT requirements with respect to novelty or inventive activity, cf. documents D1 through D4 and the corresponding text passages indicated in the search report.
- 1.3 The combination of features contained in the dependent Claim 3 is neither known from the present related art nor made obvious by it.
- 2.1 From the description and Claim 9 it can be gathered that the design of the spray-discharge orifices is essential for the definition of the invention.

Since the independent Claim 1 does not contain this feature, it does not meet the requirement of Article 6 PCT in connection with Rule 6.3 b) PCT, that each independent claim must contain all of the technical features that are essential to the definition of the invention.

- 2.2 Claims 1, 2, 4, 7 and 8 do not meet the requirements of Article 6 PCT since the subject matter of the claims is not clearly defined. In the claims, the attempt is made to define the subject matter by the result that is to be achieved, but thereby is stated only the object to be attained, without offering the necessary technical features for the achievement of this result.

The description and the drawing give the impression that the uniform clearance angle in Claim 2 depends on the design of the spray-discharge orifices. These two designs should therefore be added to this claim.

2.3 The term „structural measures“ in Claim 9 is unclear, Article 6 PCT. If this feature is not mentioned more clearly in the description, this sentence should be removed from Claim 9.